Protestantism, Labor Force Participation, and Employment Across Countries

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Abstract. Using data from 80 countries, this article analyzes whether Protestant religion affects labor market outcomes. Controlling for the impact of labor market regulations, business regulations, the tax burden, the business cycle, the level of economic development, demographic and geographical conditions, wars, and the transition from planned to market economy as well as unobserved country and year effects, we find that countries in which the largest portion of the population practices Protestant religion have substantially higher labor force participation and employment rates, particularly among women. We obtain the same result for a subgroup of 19 industrial countries for which we have better data to control for the impact of labor market institutions and business cycle fluctuations.

I

Introduction

As Max Weber ([1904–1905] 2002) argued in his famous essay *The Protestant Ethic and the Spirit of Capitalism*, Protestantism—particularly its Calvinist branch—cultivated an intense devotion to one's work or "calling," in order to assure oneself that one was predestined for salvation. According to Weber, Protestantism sanctified and generalized patterns of behavior among its adherents that were conducive to, and indeed essential for, the rise of modern capitalism. Key among these virtues was an intense commitment to work. As

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evidence supporting his thesis, he noted, inter alia, the larger participation of Protestants, as compared to Catholics, in modern business life of Germany at his time.

Weber ([1922] 1978) also claimed that Eastern religions like Buddhism and Islam are not supportive of the kind of disciplined work that characterizes modern capitalism. Furthermore, using survey data covering 66 countries, Guiso et al. (2003) recently found that Muslims have an especially conservative attitude toward working women.

Against this background we hypothesize that, *ceteris paribus,* labor force participation and employment in countries in which the largest portion of the population practices Protestant religion are higher than in other countries, particularly among women. Note that we do not argue that religion necessarily has a direct impact on most people's behavior today. Although in many countries parents, schools, and churches bring children up by teaching them specific religious beliefs and norms, in so-called secularized societies the impact of religion may be indirect. Indeed, Weber ([1904–1905] 2002, [1948] 1991) thought that the growth in rationalism (in economic life, public administration, and, particularly, in science), although initially stimulated by Protestantism, would increasingly undermine Protestantism's position as a social power. He argued that Protestantism had been important for the rise of modern capitalism only during the 16th to 18th centuries, namely, to stimulate entrepreneurial spirit and to assimilate workers into the factory system. Weber thought that the Protestant underpinnings of individual productivity had been replaced by secular institutions in the 19th century.

This view of an indirect impact of religion is corroborated by a more recent empirical study (Inglehart and Baker 2000). Using survey data from 65 societies, the authors find that:

> given religious traditions have historically shaped the national culture of given societies, but that today their impact is transmitted mainly through nationwide institutions, to the population of that society as a whole—even to those who have little or no contact with religious institutions. . . . The fact that a society was historically shaped by Protestantism or Confucianism or Islam leaves a cultural heritage with enduring effects that influence subsequent developments. (2000: 36, 49)

There are only a few previous empirical studies on the labor market effects of Protestantism. All of them focus on a single aspect: the effect on female labor supply. Schmidt (1993) finds that female labor force participation increased more slowly in Catholic countries than in Protestant ones. Lesthaeghe (1995) reaches a similar result. Similarly, positive correlations are reported between Protestant religion and "female work desirability" (Siaroff 1994) and between percent Protestant and egalitarian attitudes toward women's employment (Haller and Hoellinger 1994). None of these studies covers a large group of countries. Nor do they control for the impact of most other important institutions that have been found to affect the performance of the labor market.

This article empirically analyzes the effect of Protestant religion on labor force participation and employment rates among the total working-age population as well as among women and young people. Our first set of regressions covers a large group of up to 80 countries from all over the world. This group consists of industrial, developing, and transition countries (for a list of countries, see Appendix A). Subsequently, we present regressions covering a subgroup of 19 industrial countries for which we have better data to control for the impact of labor market institutions and business cycle fluctuations (for definitions and sources of all variables, see Appendix B).[1] Using data from two sets of countries, in each case employing different control variables, enables us to check the robustness of our results.[2] Section II describes the variables and the empirical strategy. Section III presents and discusses the regression results. Section IV concludes.

II

Data

We used the CIA's (2005) *World Factbook* to identify countries in which the largest portion of the population practices Protestant religion. Our variable of interest, Protestant religion, is a dummy rather than a variable indicating the percentage share of adherents to Protestantism. As dominant religions have shaped the national culture of given societies, the differences in values between religious groups within given societies are in fact relatively small (Inglehart and

Baker 2000). Thus, a dummy variable for Protestantism appears to be more likely to capture the effect of this religion on labor market performance.

As mentioned in the previous section, we use six different dependent variables to measure the effects on labor market performance: labor force participation rates and employment rates, each of which for the total working-age population as well as for women and young people. The various labor market performance variables enable us not only to determine whether Protestant religion affects the overall levels of labor force participation and employment; they also enable us to analyze whether it affects two important demographic groups.

Most of the labor market performance data used in this article come from the latest edition of the ILO's (2005) *Key Indicators of the Labour Market*. All series are exclusively based on labor force surveys. The labor force participation series are harmonized to account for differences in national data collection and tabulation methodologies as well as for other country-specific factors such as military requirements. The employment series are harmonized to a large extent. With regard to age limits, for example, most national employment series presented in this publication refer to the age group 15 years and older. Furthermore, for the latest edition of its *Key Indicators of the Labour Market* the ILO has "cleaned" the national employment series to eliminate breaks in series. Thus, these data are comparable over time.

In our first set of regressions covering a large group of up to 80 industrial, developing, and transition countries, we control for various factors that are likely to influence variations in labor force participation and employment rates among these different types of countries. Specifically, we control for the impact of labor market regulations, business regulations, the tax burden, the business cycle, the level of economic development, demographic and geographical conditions, wars, and the transition from planned to market economy. Additionally, we control for unobserved year-specific effects.

In the regressions for our subgroup of 19 industrial countries, because of much better data availability we are able to control for the impact of most labor market institutions that have been considered in the recent literature (see, e.g., Nickell et al. 2005; Bassanini and Duval 2006). Specifically, we control for trade union density, wage

bargaining centralization and coordination, tax wedge, employment protection legislation, unemployment benefits replacement rates, and active labor market policies. Furthermore, we control for the state of the business cycle and the level of economic development. Finally, in the regressions to explain labor force participation and employment among youths, we control for the share of young people enrolled in tertiary education. We employ the tertiary enrollment rate in the regressions for both the large and the small group of countries.

Except for the variables to control for business cycle fluctuations, all independent economic variables were lagged by one year to allow for slow adjustment and to avoid simultaneity problems. For example, changes in the strictness of labor market regulations are likely to affect the performance of the labor market only after some time. The respective variables were lagged in the regressions for both groups of countries.

The regression coefficients are estimated using the random effects, feasible generalized least squares procedure that incorporates time-invariant country effects (Swamy-Arora method). This enables us to exploit both the cross-country and the time-series variation included in the sample while simultaneously controlling for unobserved country effects.[3] Allowing for cross-country differences in labor market performance that reflect the influence of omitted variables is highly desirable, but the random effects method for doing so produces biased estimates if variables included as controls are correlated with country-specific error terms. Therefore, a Hausman test for misspecification of the random effects model is shown for each regression. As the results from this test indicate, none of our regressions for the large group of countries is biased (Tables 1 and 2) and only two out of six regressions for the small group are (Tables 3 and 4). Finally, to correct for heteroskedasticity, we estimate robust *t*-statistics using the technique developed by White.

III

Results

TABLES 1 AND 2 PRESENT the results for the large group of countries, Tables 3 and 4 the ones for the subgroup of industrial countries. For

Table 1

Regressions to Explain Labor Force Participation around the World[a]

	Labor Force Participation Rate	Female Labor Force Participation Rate	Youth Labor Force Participation Rate
	(1)	(2)	(3)
Protestant religion	6.59***	12.77***	8.60**
	(4.32)	(6.15)	(2.38)
Flexible labor market regulations	−1.69	−4.94	1.92
	(−0.71)	(−1.40)	(0.44)
Flexible business regulations	1.18	1.41	−1.77
	(0.63)	(0.49)	(−0.51)
Low top marginal tax rate	−0.13	−2.18	0.76
	(−0.10)	(−1.26)	(0.37)
GDP growth gap	0.21	0.52	−0.63
	(0.51)	(0.84)	(−1.05)
GDP per capita	0.23***	0.41***	0.04
	(3.92)	(5.57)	(0.22)
Population aged 0–14	−4.63	−18.98	3.24
	(−0.49)	(−1.36)	(0.18)
Ethnic fractionalization	−5.65*	−9.35*	−8.49
	(−1.79)	(−1.88)	(−1.40)

War	0.91	0.98	1.75*
	(1.36)	(1.29)	(1.66)
Transition country	1.71	8.81***	−9.48**
	(0.78)	(2.77)	(−2.32)
Tropical area	6.42***	9.45***	5.45*
	(3.31)	(2.85)	(1.91)
Distance to coastline	5.88***	10.14***	8.62**
	(3.23)	(3.82)	(2.45)
Tertiary enrollment rate			−1.53
			(−0.41)
Number of observations	273	273	264
Number of countries	79	79	77
R^2	0.43	0.45	0.27
Standard error of regression	1.04	1.48	2.03
F-statistic	12.75***	13.91***	5.83***
Hausman test[b]	10.07	13.69	5.21

[a]Feasible generalized least squares estimates with country-specific random effects (Swamy-Arora method). All regressions are based on data for the years 1995, 1996, and 2000 to 2003. The following variables were lagged by one year: flexible labor market regulations; flexible business regulations; low top marginal tax rate; GDP per capita. Heteroskedasticity-consistent *t*-statistics in parentheses (White method). *** (**/*) denotes statistically significant at the 1% (5%/10%) level. All regressions also contain year dummies and a constant term.

[b]χ^2 statistic.

Table 2

Regressions to Explain Employment around the World[a]

	Employment Rate	Female Employment Rate	Youth Employment Rate
	(1)	(2)	(3)
Protestant religion	5.53***	10.74***	10.06***
	(2.63)	(4.42)	(2.88)
Flexible labor market regulations	3.72	3.33	27.65***
	(0.90)	(0.80)	(3.83)
Flexible business regulations	−1.32	−1.61	−6.74
	(−0.38)	(−0.42)	(−0.90)
Low top marginal tax rate	0.16	−0.62	4.80
	(0.07)	(−0.26)	(1.35)
GDP growth gap	0.42	1.04	−0.78
	(0.57)	(1.24)	(−0.59)
GDP per capita	0.44***	0.54***	0.22
	(2.68)	(3.16)	(0.50)
Population aged 0–14	7.76	−11.66	56.84
	(0.41)	(−0.53)	(1.07)
Ethnic fractionalization	−5.20	−4.58	−12.10
	(−1.05)	(−0.76)	(−1.18)

War	0.85	−0.20	3.56
	(0.62)	(−0.12)	(1.57)
Transition country	3.81	8.36**	−11.01*
	(1.18)	(2.16)	(−1.67)
Tropical area	10.84***	13.36***	6.13
	(3.94)	(3.93)	(0.57)
Distance to coastline	4.08	6.29*	6.80
	(1.56)	(1.88)	(1.03)
Tertiary enrollment rate			0.79
			(0.13)
Number of observations	201	197	138
Number of countries	70	69	38
R^2	0.64	0.54	0.37
Standard error of regression	1.73	1.75	3.15
F-statistic	22.12***	14.06***	4.52***
Hausman test[b]	7.02	10.47	7.34

[a]Feasible generalized least squares estimates with country-specific random effects (Swamy-Arora method). All regressions are based on data for the years 1995, 1996, and 2000 to 2003. The following variables were lagged by one year: flexible labor market regulations; flexible business regulations; low top marginal tax rate; GDP per capita. Heteroskedasticity-consistent *t*-statistics in parentheses (White method). *** (**/*) denotes statistically significant at the 1% (5%/10%) level. All regressions also contain year dummies and a constant term.
[b]χ^2 statistic.

Table 3

Regressions to Explain Labor Force Participation in Industrial Countries[a]

	Labor Force Participation Rate	Female Labor Force Participation Rate	Youth Labor Force Participation Rate
	(1)	(2)	(3)
Protestant religion	6.06***	11.03***	7.40*
	(3.39)	(3.95)	(1.79)
Trade union density	−0.28	−4.76	20.98***
	(−0.14)	(−1.65)	(4.53)
Wage bargaining centralization & coordination	−0.21	−0.08	−1.98**
	(−0.57)	(−0.17)	(−2.45)
Tax wedge	−6.76*	−4.72	−31.56***
	(−1.79)	(−0.87)	(−4.10)
Employment protection legislation	−0.26	−0.12	0.96
	(−0.70)	(−0.22)	(1.52)
Unemployment benefits replacement rates	−1.37	0.69	−9.68**
	(−0.64)	(0.21)	(−2.50)
Active labor market policies	0.16***	0.16***	0.36***
	(4.19)	(2.89)	(6.11)
Output gap	0.02	−0.10*	0.59***
	(0.43)	(−1.77)	(6.81)

Income per capita	0.18***	0.45***	−0.13
	(4.96)	(8.18)	(−1.65)
Tertiary enrollment rate			−6.12***
			(−2.99)
Number of observations	247	247	247
Number of countries	19	19	19
R^2	0.42	0.54	0.53
Standard error of regression	1.17	1.66	2.25
F-statistic	19.21***	31.24***	26.84***
Hausman test[b]	11.92	10.41	20.09**

[a]Feasible generalized least squares estimates with country-specific random effects (Swamy-Arora method). All regressions are based on data for the years 1989 to 2002. The following variables were lagged by one year: trade union density; wage bargaining centralization & coordination; tax wedge; employment protection legislation; unemployment benefits replacement rates; active labor market policies; income per capita. Heteroskedasticity-consistent *t*-statistics in parentheses (White method). *** (**/*) denotes statistically significant at the 1% (5%/10%) level. All regressions also contain a constant term.

[b]χ^2 statistic.

Table 4

Regressions to Explain Employment in Industrial Countries[a]

	Employment Rate	Female Employment Rate	Youth Employment Rate
	(1)	(2)	(3)
Protestant religion	6.26***	11.69***	7.30**
	(2.96)	(3.55)	(2.09)
Trade union density	−3.45	−10.18***	11.63**
	(−1.38)	(−3.27)	(2.18)
Wage bargaining centralization & coordination	0.32	0.57	−1.33
	(0.70)	(1.22)	(−1.55)
Tax wedge	−18.68***	−16.59***	−36.96***
	(−4.45)	(−2.92)	(−4.16)
Employment protection legislation	−0.59	−0.99*	−0.77
	(−1.40)	(−1.83)	(−1.05)
Unemployment benefits replacement rates	−6.17**	−5.86*	−11.77***
	(−2.55)	(−1.87)	(−2.82)
Active labor market policies	0.32***	0.35***	0.57***
	(7.77)	(6.84)	(7.82)
Output gap	0.36***	0.12*	0.93***
	(6.95)	(1.84)	(9.68)

Income per capita	0.20***	0.43***	−0.13*
	(4.79)	(7.43)	(−1.86)
Tertiary enrollment rate			−7.55***
			(−3.51)
Number of observations	247	247	243
Number of countries	19	19	19
R^2	0.70	0.71	0.65
Standard error of regression	1.34	1.63	2.44
F-statistic	60.97***	63.24***	44.03***
Hausman test[b]	13.35	12.30	27.52***

[a]Feasible generalized least squares estimates with country-specific random effects (Swamy-Arora method). All regressions are based on data for the years 1989 to 2002. The following variables were lagged by one year: trade union density; wage bargaining centralization & coordination; tax wedge; employment protection legislation; unemployment benefits replacement rates; active labor market policies; income per capita. Heteroskedasticity-consistent *t*-statistics in parentheses (White method). ***(**/*) denotes statistically significant at the 1%(5%/10%) level. All regressions also contain a constant term.

[b]χ^2 statistic.

both groups, the estimates for our variable of interest consistently indicate that labor force participation and employment rates are comparatively higher in Protestant countries, both among the total working-age population and among the two demographic groups. The coefficient on the Protestant religion variable is statistically significant in each of our regressions.

Protestant religion appears to make a large difference. Compared to countries dominated by other religions, labor force participation rates are between 6.1 and 6.6 percentage points higher in Protestant countries, *ceteris paribus*.[4] Similarly, employment rates are between 5.5 and 6.3 percentage points higher, *ceteris paribus*.

Unsurprisingly, the effect on women is even larger. Compared to countries dominated by other religions, female labor force participation rates are between 11.0 and 12.8 percentage points higher, while female employment rates are between 10.7 and 11.7 percentage points higher in Protestant countries, *ceteris paribus*.

Young people's labor market involvement is also substantially higher in Protestant countries. Compared to countries dominated by other religions, youth labor force participation rates are between 7.4 and 8.6 percentage points higher, while youth employment rates are between 7.3 and 10.1 percentage points higher, *ceteris paribus*.

How can Protestant religion make such a huge difference to labor market performance even today? One possibility is that there still is a significant number of Protestants who believe in predestination and thus work hard to assure themselves that they have in fact been selected for salvation. However, as Landes (1998) points out, the belief in predestination did not last more than a generation or two after the Reformation. He argues that Protestantism rather generalized the virtue of hard and diligent work among its adherents, who judged one another by conformity to this standard. Thus, most Protestants today are likely to work not in order to attain certainty of salvation but because their parents taught them the virtue of work.

An even more important transmission channel is indicated by Inglehart and Baker's (2000) finding that dominant religions have shaped the national culture of given societies, with differences in values between religious groups within given societies being relatively small. This suggests that the Protestant virtue of hard and diligent

work has become part of a national culture of the relevant countries. Today these values and norms are transmitted by educational institutions and mass media to all people living in a Protestant country. While the majority of individuals may have little or no contact with the church today, the impact of living in a society that was historically shaped by once-powerful Protestant institutions persists today, shaping everyone—Protestants as well as others—to fit into a given national culture that includes the value of hard and diligent work (Inglehart and Baker 2000). Conversely, countries dominated by other religions (e.g., Catholicism, Islam, Buddhism) are likely to have developed a national culture that does not put a high value on hard and diligent work and may be hostile toward paid employment of women.

Note that our account is largely consistent with Weber's own argument (Section I). Thus, as far as the link between Protestantism, on the one hand, and labor force participation and employment rates, on the other, is concerned, both our empirical findings and our interpretation suggest that there may be more to his argument today than is commonly realized.

IV

Conclusion

OUR RESULTS INDICATE that Protestant religion is likely to have a major impact on labor market performance. Countries in which the largest portion of the population practices Protestant religion have substantially higher labor force participation and employment rates, particularly among women. The Protestant ethic that stresses hard and diligent work appears to have an enduring impact on people's labor market involvement. The fact that we obtain the same result for the subgroup of industrial countries as for the large group of countries suggests that the Protestant work ethic is likely to be influential even in today's modern societies.

Although we control for a host of factors that are likely to affect the performance of the labor market (including unobserved country effects) and although our results are very robust across our two groups of countries, more research is clearly warranted. In particular, the transmission channels from religious denominations to labor market

performance need to be more closely scrutinized in future research, both theoretically and empirically. Furthermore, the policy implications of our findings need to be thoroughly discussed. As governments can hardly influence religious denominations (except in totalitarian regimes), the scope for public policy to increase labor force participation and employment rates may be smaller than previously thought.

Notes

1. Due to variations in data availability, the regressions covering our large group of countries are based on data from the years 1995, 1996, and 2000 to 2003, while the regressions covering the subgroup of industrial countries are based on data from the years 1989 to 2002.

2. We also checked the robustness of our results by excluding from the sample statistical outliers, or any particular country, or any random draw of 10 percent of observations. None of these checks had any noticeable impact on the coefficient of our variable of interest (results not reported here).

3. As there is no time-series variation in the data for our variable of interest, the fixed-effects model is not a feasible alternative to control for unobserved country effects. It only uses the time-series variation within countries.

4. The figures in this and the following two paragraphs are based on the coefficients from the regressions for the large and the small group of countries, respectively.

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Appendix A: List of Countries

Argentina, Australia,[a] Austria,[a] Bangladesh, Belgium,[a] Bolivia, Botswana, Brazil, Bulgaria, Canada,[a] Chile, China, Colombia, Costa Rica, Croatia, Czech Republic, Denmark,[a] Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland,[a] France,[a] Germany,[a] Greece, Guatemala, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy,[a] Jamaica, Japan,[a] Jordan, Latvia, Lithuania, Luxembourg, Malaysia, Malta, Mauritius, Mexico, Morocco, Namibia, Netherlands,[a] New Zealand,[a] Nicaragua, Norway,[a] Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal,[a] Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain,[a] Sri Lanka, Sweden,[a] Switzerland,[a] Taiwan, Thailand, Trinidad & Tobago, Turkey, Ukraine, United Kingdom,[a] United States,[a] Uruguay, Venezuela, Zambia.

[a] Member of the group of 19 industrial countries.

Appendix B: Definitions and Sources of Variables

Active labor market policies: Expenditure on active labor market programs per unemployed person, divided by 1,000. Source: OECD (2004b).

Distance to coastline: Mean distance to nearest ice-free coastline, measured in thousands of kilometers. Source: Center for International Development (2001), author's calculations.

Employment protection legislation: Indicator for strictness of protection against individual dismissals and for strictness of regulation of temporary employment (fixed-term contracts, temporary work agency employment). The indicator ranges from 0 to 6, with higher values representing stricter regulation. Source: OECD (2004b).

Employment rate: Percentage of working-age population in employment. Labor force survey data. Source: International Labour Office (2005).

Ethnic fractionalization: One minus the Herfindahl index of ethnic group shares, reflecting the probability that two randomly selected individuals from a population belong to different groups. The variable is based on data covering approximately 650 distinct ethnic groups in 190 countries and dependencies. The definition of ethnicity involves a combination of racial and linguistic characteristics. The classifications reflect the judgments of ethnologists and anthropologists on the appropriate definition of ethnicity. Source: Alesina et al. (2003).

Female employment rate: Percentage of female working-age population in employment. Labor force survey data. Source: International Labour Office (2005).

Female labor force participation rate: Female labor force (employed and unemployed) as a percentage of the female population. Age group: 15 to 64 years. Harmonized series. Source: International Labour Office (2005).

Flexible business regulations: Subindex of the Economic Freedom of the World (EFW) index, consisting of five indicators. The first indicator, price controls, measures the extent to which businesses are free to set their own prices. The ratings for the other four indicators are based on results from the World Economic Forum's annual Executive Opinion Surveys. The participants are asked to indicate on a numerical scale whether they agree or disagree with a specific statement. The four survey statements are: "Administrative procedures are an important obstacle to starting a new business"; "Senior management spends a substantial amount of time dealing with government bureaucracy"; "Starting a new business is generally easy"; and "Irregular, additional payments connected with import and export permits, business licenses, exchange controls, tax assessments, police protection, or loan applications are very rare." All indicators carry equal weights. The rating scale ranges from 0 to 10, with higher values representing more flexible regulation. For the purpose of this article, the ratings were divided by 10. Source: Gwartney and Lawson (2005).

Flexible labor market regulations: Subindex of the Economic Freedom of the World (EFW) index, consisting of five indicators. The ratings

for the first four indicators are based on results from the World Economic Forum's annual Executive Opinion Surveys. The participants are asked to indicate on a numerical scale to what extent they agree or disagree with a specific statement. The four survey statements are: "The minimum wage, set by law, has little impact on wages because it is too low or not obeyed"; "Hiring and firing practices of companies are determined by private contract"; "The share of labor force whose wages are set by centralized collective bargaining is low"; and "The unemployment benefits system preserves the incentives to work." The fifth indicator, military conscription, measures the use of conscripts to obtain military personnel, including duration of military conscription. All indicators carry equal weights. The rating scale ranges from 0 to 10, with higher values representing more flexible regulation. For the purpose of this article, the ratings were divided by 10. Source: Gwartney and Lawson (2005).

GDP growth gap: Annual percentage growth rate of real GDP during the current year minus average annual percentage growth rate of real GDP during the previous 10 years, divided by 10. Source: World Bank (2006), author's calculations.

GDP per capita: Gross domestic product per capita, converted to constant 2000 international dollars using purchasing power parity rates, divided by 1,000. Source: Directorate-General of Budget, Accounting and Statistics (2005); World Bank (2005).

Income per capita: Gross national income divided by midyear population, converted into current international dollars using purchasing power parity rates, divided by 1,000. Source: World Bank (2005).

Labor force participation rate: Labor force (employed and unemployed) as a percentage of the population. Age group: 15 to 64 years. Harmonized series. Source: International Labour Office (2005).

Low top marginal tax rate: Subindex of the Economic Freedom of the World (EFW) index, based on the top marginal income and payroll tax rate and on the income threshold at which the top marginal income tax rate applies. The rating scale ranges from 0 to 10, with higher values representing lower marginal tax rates and higher income thresholds. For the purpose of this article, the ratings were divided by 10. Source: Gwartney and Lawson (2005).

Output gap: Deviations of actual GDP from potential GDP as a per cent of potential GDP. Source: OECD (2005).

Population aged 0–14: The share of the total population that is in the age group 0 to 14 years. Source: Directorate-General of Budget, Accounting and Statistics (2005); World Bank (2006).

Protestant religion: Dummy variable for countries in which the largest portion of the population practices Protestant religion. Source: CIA (2005).

Tax wedge: Income tax plus employee's and employer's social security contributions less cash benefits as a share of labor costs; one-earner family with two children; average production worker. Source: OECD (2004c).

Tertiary enrollment rate: Students enrolled in tertiary education, regardless of age, as a share of the population of the age group that officially corresponds to this level of education. Source: Directorate-General of Budget, Accounting and Statistics (2005); World Bank (2006).

Trade union density: Share of employees in trade unions. Source: OECD (2004b).

Transition country: Dummy variable for countries in transition from centrally planned to market economy.

Tropical area: Share of land area in geographical tropics. Source: Center for International Development (1999, 2001).

Unemployment benefits replacement rates: Gross unemployment benefits as a share of previous gross wage earnings. Averages across two earnings levels, three family types, and three unemployment duration categories. Source: OECD (2004a).

Wage bargaining centralization & coordination: Degree of centralization/coordination in wage bargaining. The indicator ranges from 1 to 5, with higher values representing a higher degree of centralization and coordination. Source: OECD (2004b).

War: Dummy variable for interstate and internal wars in the respective country. Source: Centre for the Study of Civil War (2005).

Youth employment rate: Employed aged 15 to 24 years as a percentage of the population in the same age bracket. Labor force survey data. Source: European Commission (2005); OECD (2005).

Youth labor force participation rate: Labor force (employed and unemployed) as a percentage of population. Age group: 15 to 24. Harmonized series. Source: International Labour Office (2005).